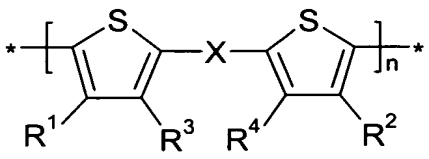
Patent Claims

1. In a component or device containing a semiconductor or charge transport material, the improvement wherein said material comprises at least one mono-, oligo- or polymer of formula I



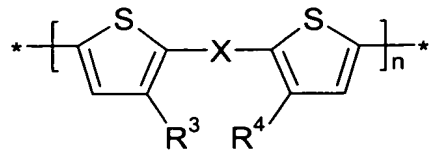
I

wherein

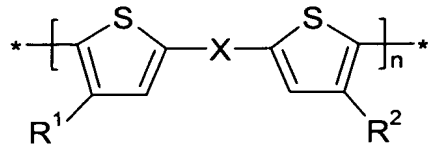
X	is $-CX^1=CX^2-$, $-C\equiv C-$, optionally substituted arylene, optionally substituted or heteroarylene,
X^1 and X^2	are independently of each other H, F, Cl or CN,
R^1 - R^4	are independently of each other H, halogen, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or P-Sp-,
P	is a polymerisable or reactive group,
Sp	is a spacer group or a single bond, and
n	is an integer ≥ 1,

with the proviso that, if X is unsubstituted thiophene-2,5-diyl and R^1 and R^2 are H, then at least one of R^3 and R^4 is selected from alkyl that is mono-or polysubstituted by F, Cl, Br, I or CN, cycloalkyl that is mono-or polysubstituted by F, Cl, Br, I or CN, optionally substituted aryl, optionally substituted heteroaryl, and P-Sp-.

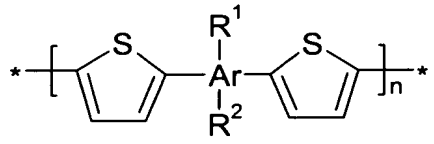
2. A component or device according to claim 1, wherin said mono-, oligo- or polymer is selected from formulae Ia - Ic:



Ia



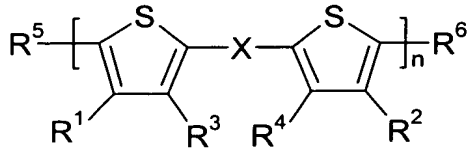
Ib



Ic

wherein R^1 to R^4 are different from H, and Ar is arylene or heteroarylene.

3. A component or device according to at least one of claims 1 and 2, wherein said mono-, oligo- or polymer is of formula I1



I1

wherein

R^5 and R^6 are independently of each other H, halogen, $B(OR^7)(OR^8)$, $SnR^9R^{10}R^{11}$, straight chain, branched or cyclic alkyl with 1 to 20 C-atoms, which is unsubstituted, mono- or polysubstituted by F, Cl, Br, I or CN, and wherein one or more non-adjacent CH_2 groups are optionally replaced, in each case independently from one another, by -O-, -S-, -NH-, -

NR^0-, -SiR^0R^{00}-, -CO-, -COO-, -OCO-, -OCO-O-, -SO_2-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a manner that O and/or S atoms are not linked directly to one another, optionally substituted aryl, optionally substituted heteroaryl or P-Sp-,

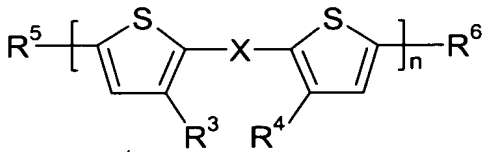
R^0 and R^{00} are independently of each other H or alkyl with 1 to 12 C-atoms,

R^7 and R^8 are independently of each other H or alkyl with 1 to 12 C-atoms, or

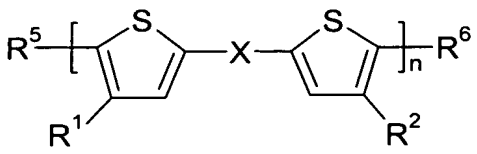
OR^7 and OR^8 together with the boron atom form a cyclic group having 2 to 10 C atoms, and

R^9 to R^{11} are independently of each other H or alkyl with 1 to 12 C-atoms.

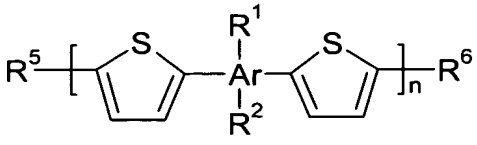
4. A component or device according to at least one of claims 1 to 3, wherein said mono-, oligo- or polymer is selected from formulae I1a - I1c:



I1a



I1b



I1c

wherein

R^1 - R^4 are independently of each other H, halogen, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or P-Sp-,

R^5 to R^6 are independently of each other H, halogen, $B(OR^7)(OR^8)$, $SnR^9R^{10}R^{11}$, straight chain, branched or cyclic alkyl with 1 to 20 C-atoms, which is unsubstituted, mono- or polysubstituted by F, Cl, Br, I or CN, and wherein one or more non-adjacent CH_2 groups are optionally replaced, in each case independently from one another, by -O-, -S-, -NH-, -NR^0-, -SiR^0R^{00}-, -CO-, -COO-, -OCO-, -OCO-O-, -SO_2-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a manner that O and/or S atoms are not linked directly to one another, optionally substituted aryl, optionally substituted heteroaryl or P-Sp-,

R^0 and R^{00} are independently of each other H or alkyl with 1 to 12 C-atoms,

X is $-CX^1=CX^2-$, -C≡C-, optionally substituted arylene, optionally substituted or heteroarylene,

Ar is arylene or heteroarylene, and

n is an integer ≥ 1.

5. A component or device according to at least one of claims 1 to 4, wherein said material contains a oligo- or polymer of formula I having a regioregularity of at least 95%.

6. A component or device according to at least one of claims 1 to 5, wherein n is an integer from 1 to 5000.

7. A component or device according to at least one of claims 1 to 6, wherein

R^1 to R^4 are each independently selected from H, halogen, straight chain, branched or cyclic alkyl with 1 to 20 C-atoms, which is unsubstituted, mono- or polysubstituted by F, Cl, Br, I or CN, and wherein one or more non-adjacent CH_2 groups are optionally replaced, in each case independently from one another, by -O-, -S-, -NH-, $-NR^0-$, $-SiR^0R^{00}-$, -CO-, -COO-, -OCO-, -OCO-O-, $-SO_2-$, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a manner that O and/or S atoms are not linked directly to one another, optionally substituted aryl, optionally substituted heteroaryl and P-Sp-, and

R^0 and R^{00} are independently of each other H or alkyl with 1 to 12 C-atoms.

8. A component or device according to at least one of claims 1 to 7, wherein

R^1 to R^4 are each independently selected from C_1-C_{20}-alkyl that is optionally substituted with one or more fluorine atoms, C_1-C_{20}-alkenyl, C_1-C_{20}-alkynyl, C_1-C_{20}-alkoxy, C_1-C_{20}-thioalkyl, C_1-C_{20}-silyl, C_1-C_{20}-ester, C_1-C_{20}-amino, C_1-C_{20}-fluoroalkyl, $(CH_2CH_2O)_m$ with m being an integer from 1 to 6, optionally substituted aryl, optionally substituted heteroaryl.

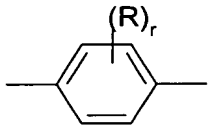
9. A component or device according to at least one of claims 1 to 7, wherein

R^1 to R^4 are each independently selected from C_1-C_{20}-alkyl or C_1-C_{20}-fluoroalkyl.

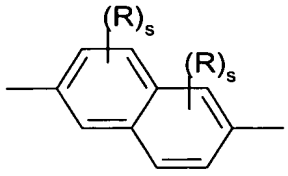
10. A component or device according to at least one of claims 1 to 9, wherein X and $Ar(R^1R^2)$ are each independently mono-, bi- or tricyclic arylene or heteroarylene with up to 25 C atoms, wherein the rings can be fused, and in which the heteroaromatic groups contain at least one hetero ring atom, and wherein said arylene and heteroarylene groups are optionally substituted with one or

more of F, Cl, Br, I, CN, and straight chain, branched or cyclic alkyl having 1 to 20 C atoms, which is unsubstituted, mono- or poly-substituted by F, Cl, Br, I, -CN or -OH, and in which one or more non-adjacent CH_2 groups are optionally replaced, in each case independently from one another, by -O-, -S-, -NH-, -NR^0-, -SiR^0R^{00}-, -CO-, -COO-, OCO-, -OCO-O, -S-CO-, -CO-S-,-CH=CH- or -C≡C- in such a manner that O and/or S atoms are not linked directly to one another.

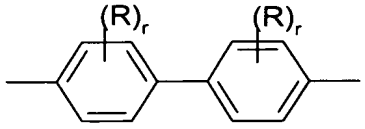
11. A component or device according to at least one of claims 1 to 10, wherein X is selected from formulae IIa-IIn and their mirror images



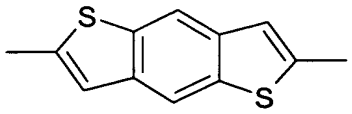
IIa



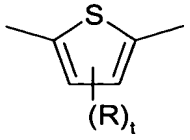
IIb



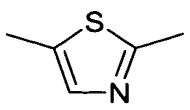
IIc



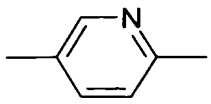
IId



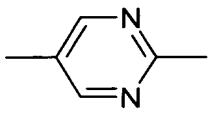
IIe



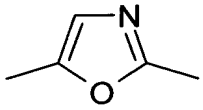
IIf



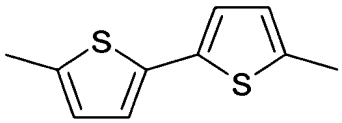
IIg



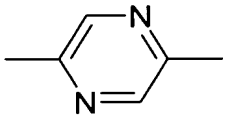
IIh



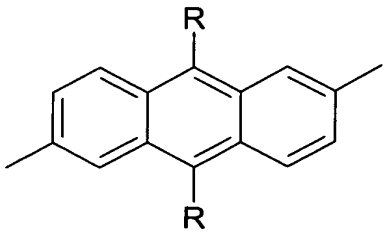
IIi



IIk



IIm



IIn

wherein

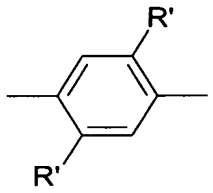
R is in each case independently H, halogen, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or P-Sp-,

r is 0, 1, 2, 3 or 4,

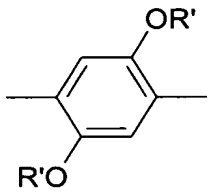
s is 0, 1, 2 or 3, and

t is 0, 1 or 2.

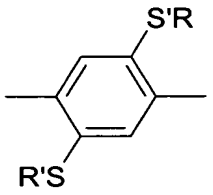
12. A component or device according to at least one of claims 2 to 11, wherein $Ar(R^1R^2)$ is selected from formulae IIIa - IIIe and their mirror images



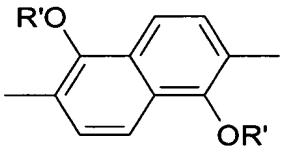
IIIa



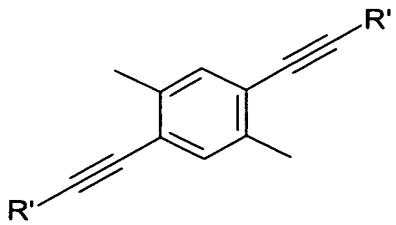
IIIb



IIIc



IIId



IIIe

wherein

R' is in each case independently of each other H, halogen, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or P-Sp-.

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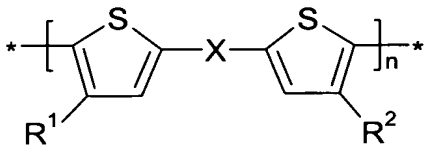
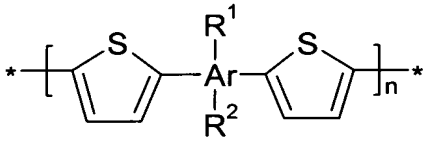
13. A mono-, oligo- or polymer of formula Ia - Ic

Ia



Ib



Ic

wherein

X	is $-CX^1=CX^2-$, $-C\equiv C-$, optionally substituted arylene, optionally substituted or heteroarylene,
X^1 and X^2	are independently of each other H, F, Cl or CN,
R^1 - R^4	are independently of each other halogen, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or P-Sp-,
P	is a polymerisable or reactive group,
Sp	is a spacer group or a single bond, and

n is an integer ≥ 1, and

Ar is arylene or heteroarylene,

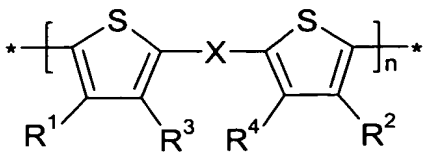
with the provisos that

a) if X or Ar is unsubstituted thiophene-2,5-diyl, then at least one of R^{1-4} is alkyl that is mono- or polysubstituted by F, Cl, Br, I or CN, cycloalkyl that is mono- or polysubstituted by F, Cl, Br, I or CN, optionally substituted aryl, optionally substituted heteroaryl, or P-Sp-, and

b) X and Ar(R^1R^2) are different from dithienothiophene, 1,4-phenylene, 2,5-dialkyl- or 2,5-dialkoxy-1,4-phenylene, furan-2,5-diyl, 1-alkyl-1H-pyrrol-2,5-diyl, 9H-fluorene-2,7-diyl, 9,9-dialkyl-9H-fluorene-2,7-diyl, N-alkyl-9H-carbazole-2,7-diyl and anthracene-9,10-diyl, and

c) Ar(R^1R^2) is different from 2,5-dialkyl- or 2,5-dialkoxy-1,4-phenylene, naphthalene-2,6-diyl, naphthalene-4,8-diyl that is substituted in 1-, 4-, 5- and/or 8-position with alkoxy, dimethylsiloxane or oxymethyloxirane groups, 9,9-dialkyl-9H-fluorene-2,7-diyl and N-alkyl-9H-carbazole-2,7-diyl.

14. A polymerisable liquid crystal material comprising one or more mono-, oligo- or polymers of fomula I wherein at least one of the mono-, oligo- and polymers of fomula I comprises at least one polymerisable group, and optionally comprising one or more further polymerisable compounds, wherein said at least one of the mono-, oligo- and polymers of fomula I and/or said one or more further polymerisable compounds is mesogenic or liquid crystalline,



I

wherein

X	is $-CX^1=CX^2-$, $-C\equiv C-$, optionally substituted arylene, optionally substituted or heteroarylene,
X^1 and X^2	are independently of each other H, F, Cl or CN,
R^1 - R^4	are independently of each other H, halogen, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or P-Sp-,
P	is a polymerisable or reactive group,
Sp	is a spacer group or a single bond, and
n	is an integer ≥ 1,

with the proviso that, if X is unsubstituted thiophene-2,5-diyl and R^1 and R^2 are H, then at least one of R^3 and R^4 is selected from alkyl that is mono-or polysubstituted by F, Cl, Br, I or CN, cycloalkyl that is mono-or polysubstituted by F, Cl, Br, I or CN, optionally substituted aryl, optionally substituted heteroaryl, and P-Sp-.

15. Anisotropic polymer film with charge transport properties obtainable from a polymerisable liquid crystal material according to claim 14 that is aligned in its liquid crystal phase into macroscopically uniform orientation and polymerised or crosslinked to fix the oriented state.

16. A side chain liquid crystal polymer obtained by polymerisation of one or more mono- or oligomers or a polymerisable material as defined in claim 14, or by grafting one or more mono- or oligomers or a polymerisable material as defined in claim 14 to a polymer backbone in a polymeranaloguous reaction, optionally with one or more additional mesogenic or non-mesogenic comonomers.

17. In an optical, electrooptical or electronic devices,field effect transistors (FET), thin film transistor (TFT), radio frequency identification (RFID) tag, a semiconducting component for organic light emitting diode (OLED) applications, a charge transport or electroluminescent layer in an electroluminescent displays, or a backlight of a liquid crystal display, containing semiconductor or charge transport material, the improvement wherein said material contains a polymerisable material according to claim 14.

18. In an optical, electrooptical or electronic devices,field effect transistors (FET), thin film transistor (TFT), radio frequency identification (RFID) tag, a semiconducting component for organic light emitting diode (OLED) applications, a charge transport or electroluminescent layer in an electroluminescent displays, or a backlight of a liquid crystal display, containing semiconductor or charge transport material, the improvement wherein said material contains a mono-, oligo- or polymer according to claim 13.

19. In photovoltaic or sensor device, containing electroluminescent material, the improvement wherein said material contains a mono-, oligo- or polymer according to claim 13.

20. In a battery containing electrode material, the improvement wherein said material contains a mono-, oligo- or polymer according to claim 13.

21. In a battery containing electrode material, the improvement wherein said material contains a mono-, oligo- or polymer according to claim 13.

22. In a photoconductor, the improvement wherein said photoconductor contains a mono-, oligo- or polymer according to claim 13.

23. In a method of electrophotographic recording, the improvement wherein a mono-, oligo- or polymer according to claim 13 is employed as electrophotgraphic material.

24. A component or device according to at least one of claims 1 to 12, wherein said device is an optical, electrooptical or electronic device, FET, integrated circuit (IC), TFT or OLED.

25. A component or device according to at least one of claims 1 to 12, wherein said device is a TFT or TFT array for flat panel displays, a radio frequency identification (RFID) tag, an electroluminescent display or backlight.

26. In a security marking or device comprising a FET or an RFID tag, the improvement wherein said FET or RFID tag is according to claim 25.

27. A mono-, oligo- and polymer, material or polymer as defined in at least one of claims 1 to 16, which is oxidatively or reductively doped to form conducting ionic species.

28. In a charge injection layer, planarising layer, antistatic film or conducting substrate or pattern for electronic applications or flat panel displays, the improvement wherein said layer, film, substrate, pattern or display conatins a mono-, oligo- or polymer, material or polymer according to claim 27.